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METALWORKING INDUSTRY IN POLISH SIX-YEAR PLANMechanik

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Mech Engr Janusz Tymowski

In 1939, the value of the production of heavy and medium industries in Poland was 8.6 billion prewar zlotys. In 1949, it increased to 15.3 billion zlotys, or 177 percent of the prewar production value. In 1955, the value of production will increase to 36.5 billion zlotys, or 425 percent of the value of prewar production. The total value of production for all industry in 1955 will be 43.8 billion zlotys.

The achievement of the production targets of the Six-Year Plan requires priorities for the production of metallurgical, mining, and electric power equipment, railroad and highway rolling stock, internal plant transportation facilities, and machine tools. The magnitude of the plan can be seen in an example from the metallurgical industry. To increase production of pig iron by one million tons and to process it into rolled products, 40,000 tons of machinery and other equipment, such as blast furnaces, open-hearth furnaces, special cranes, blowers, rolling equipment, etc., are needed.

Thus, the Six-Year Plan calls for a much more rapid development of capital goods production and an increase in its share in the total production value. In 1937, capital equipment's share in the total production value of heavy and medium industry was 47 percent; at the end of the Three-Year Plan, it was 59.1 percent. In 1955, it should reach 63.5 percent.

The metalworking industry, which supports the production of capital goods, produces not only equipment and structural steel for factories, but also machinery to produce machine tools and engines.

Although the metalworking industry was the second largest industry with respect to employment and production value in Poland in 1937, nevertheless, its production was geared to service small workshops, handicrafts, and small farms.

Before World War II, the only plant producing heavy machinery was the Zgoda Metallurgical Plant (Huta Zgoda), which was occupied mainly with repairs for the mining and metallurgical enterprises in Gory Slask. Stalowa Wola Metallurgical Plant (Huta Stalowa Wola), construction of which was not yet completed, was engaged in military production. The Lilpop Enterprises (Zaklady Lilpopa) also had certain minor production capabilities. Theoretically, the Gdansk Shipyard (Stocznia Gdanska) was also a part of the Polish economy. Excluding the locomotive plants, these plants comprised all of Poland's heavy industry.

In 1937, the engineering industry's share in the production value of the entire heavy and medium industry was only 7 percent; during the Three-Year Plan, it increased to 10 percent. The Six-Year Plan, which specifies an index of growth of 364 for the engineering industry, foresees this industry's share in the total production value as 14 percent in 1955.

During the Three-Year Plan, the railroad industry was completely reconstructed. Today, the production of locomotives is ten times the prewar production and that of freight cars is 30 times. The production of trucks, of a number of machines and equipment for the coal and petroleum industries, and of machinery for ships has been activated. The production of tractors is also expanding favorably. A number of new types of machine tools have also been developed. At present, Poland can supply much of the equipment that was previously imported.

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The most important field of production is machine tools. The development of machine-tool production is a measure of the technological progress of the entire metalworking industry.

The average prewar production of machine tools was about 800 units annually, valued at 12 million zlotys. In the latter part of the prewar period, about 2,500 units, valued at 50 million zlotys, were imported annually. The number of machine tools operating in Poland at that time was about 65,000. In 1949, 10,600 tons of machine tools were produced. By 1955, the plan envisages that production of machine tools will be 300 percent higher than the 1944 production, and that about 200 different types of machine tools will be produced.

The plan places special emphasis on the production of heavy machine tools which, in 1955, will amount to 25 percent of the total production value of machine tools. In particular, Poland will begin production of heavy vertical lathes, multiple-tool lathes, automatic lathes, and unit-type machine tools. For this purpose, construction is to begin on a new lathe factory and a new milling-machine factory. Wide expansion of two existing factories is also planned.

The tool industry, connected with the machine-tool industry, expects to increase its production of cutting tools 4 times, woodworking tools 1.7 times, tradesmen's tools 2.3 times, instruments and chucks 10 times, and gauges 12 times. These increases will be achieved mainly through the expansion of old plants and the construction of two new plants.

Requirements of the electric power industry demand greater production of boilers and turbines. Before the war, Poland produced boilers with a pressure of not more than 16 atmospheres. During the Three-Year Plan, the first boilers with a pressure of 42 atmospheres were produced. The Six-Year Plan calls for the production of high-pressure pipe-type boilers with a pressure of 80 atmospheres, and with a capacity of 100-120 tons of steam per hour. In comparison with 1949, the production of pipe-type boilers is to increase fourfold. A special boiler factory is being constructed for this purpose.

Up to now, Poland has not produced turbines. Just before the war, the Stalowa Wola Metallurgical Plant began production of Ljungstrom turbines with a capacity of 3,000 kilowatts, on the basis of a Swedish license. The production of turbine blades was begun during the Three-Year Plan. The Six-Year Plan foresees the production of turbines of great capacity. The plan foresees 1955 production of turbines capable of 125,000 kilowatts, and, during the period of the Six-Year Plan, turbines with a capacity of 225,000 kilowatts.

The development of the chemical industry, which has exceptionally favorable raw-material resources, requires considerable expansion in the production of apparatus, most of which has hitherto been imported. The plan envisages that 1955 production of apparatus will be 413.8 percent of the 1949 production. Hence, the expansion of existing plants and the construction of several new plants are planned. The apparatus industry will develop the production of ammonia compressors, so that the network of refrigerating plants can be expanded.

The production of papermaking machines will be increased fivefold through the expansion of present plants.

By 1955, in addition to turbines, the industrial equipment industry is to produce annually metallurgical machinery and equipment valued at 161 million zlotys, and hoisting equipment valued at 24.5 million zlotys. This industry is also to expand the production of marine machinery, windlasses, and marine pumps.

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Because supplies for marine construction are very diverse and often present large and special requirements, the domestic supplies of equipment for ships (purchased abroad before the war) were insignificant. Ships built during the Six-Year Plan, such as the ore and coal carriers Soldek, and Jednosc Robotnicza, and others, obtained almost all their equipment from Polish production. Marine machinery made in Poland withstood the test well. The Six-Year Plan foresees the construction of 164 principal marine machines and a full coverage by the metalworking industry of shipyard requirements for ocean-going vessels.

A special task of the machine industry is to make possible the mechanization of construction processes. Before the war, the production of construction machinery was limited to small cement mixers and road rollers. The fulfillment of the gigantic construction tasks of the Six-Year Plan is possible only with an adequate supply of equipment. In connection with this, the metalworking industry is to expand the production of building hoists (attaining 2,500 units in 1955), and begin the production of light and heavy construction cranes. The production of heavy building cranes will reach 140 units in 1955. For the mechanization of earthworks, the production of excavators (annual production will reach 75 units by 1955), bulldozers, and other construction and road machinery will be begun. The machine industry also will undertake the production of machinery for the ceramics industry.

During the Three-Year Plan, the annual production of plants producing equipment for the coal industry reached a value of 80 million zlotys. Production included miners' lamps, safety apparatus, coal cars, several types of conveyers, skips, air engines, etc. The Six-Year Plan foresees a considerable development of these plants, and their production will reach a value of 290.5 million zlotys in 1955. The plan also calls for beginning production of wall and gallery coal cutters, semiautomatic drills, duckbill loaders, conveyers of various types, extracting machines, and coal combines.

With the activation of production of drilling rigs for deep drilling, portable rigs for geological research, and complete sets of tools for rotation drilling, the requirements of the petroleum industry will be covered. In this sphere, an important step has already been made during the Three-Year Plan by beginning the production of a number of tools heretofore imported from the US. The quality of Polish-made tools is equal to that of imported ones.

During the war, machinery of the textile industry was completely devastated. Before the war, a total of 44 plants produced machinery and equipment for the textile industry. In 1939, the total production value of these plants was 10.7 million zlotys. In 1949, the production value of textile machinery plants was about 10 million zlotys, and during the Six-Year Plan, it is expected to increase to 80 million zlotys. The Six-Year Plan foresees the completion of a new spinning machine factory and the construction of a loom factory and a textile-finishing machine factory.

Before 1934, agricultural machinery factories, which were generally very small, produced machines and implements (almost exclusively horse-drawn or hand types) for small farms. The value of production dropped from a peak of 60 million zlotys in 1928 to 3 million in 1935. In 1939, it rose to 18 million zlotys. During the Three-Year Plan, specialization in factories was carried out, and production of tractor plows, harvesters, and large threshing machines was begun. The Six-Year Plan goal for 1955 is an annual production of 750 combines, 14,300 tractor plows, 5,000 tractor drills, 5,600 sheaf binders, and 6,000 motorized threshing machines. Serial production of these machines cannot be carried out rationally in present plants. Thus, two new factories will be built: a factory for harvesting machines and a factory for other agricultural machines.

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To enable agriculture to utilize this equipment, the automotive industry will increase its production of tractors, mainly the caterpillar type, from 2,340 in 1949 to 11,000 in 1955. Besides tractors, the automotive industry will achieve an even greater increase in production of motor vehicles. The annual production of  $3\frac{1}{2}$ -ton trucks will increase to 13,000, and of passenger automobiles to 12,000. A factory now being built to manufacture  $2\frac{1}{2}$ -ton trucks will have an annual production of 12,000 trucks. The production of motorcycles will increase from 4,200 in 1949 to 32,000 in 1955, and the production of bicycles from 91,100 to 340,000. A new factory will be built for the manufacture of high-compression combustion engines.

During the Three-Year Plan, the railroad rolling stock industry expanded fairly adequately. During the Six-Year Plan, the annual production is to increase to 315 standard-gauge locomotives, 18,500 freight cars (calculated as two-axle units), and 630 passenger cars. This increase is relatively small because the main emphasis is placed on the expansion of the production of narrow-gauge locomotives (250 units per year), and on the activation of the production of electric locomotives, internal-combustion locomotives, electric railroad cars, and special mine locomotives.

In the shipbuilding industry, an expansion of maritime shipyards is anticipated which will result in the production in 1955 of 150,000 dead-weight tons or eight times more than 1949 production. River shipyards should expand the production of vessels and undertake the production of tugboats to supply the increasing needs of inland navigation.

The importance of foundry production is shown by the fact that castings are encountered in almost every product of the metalworking industry; on an average, they comprise 60 percent of the weight of finished products. Despite this, the foundry industry in Poland is at a relatively low level. The number of independent foundries is relatively small. Usually the foundries are divisions of factories of the metalworking or the metallurgical industries. In the prewar period, there were 253 foundries with an annual production of 200,000 tons of cast iron, valued at 97 million zlotys. The Six-Year Plan envisages an annual production by 1955 of 724,000 tons of iron castings, 149,000 tons of steel castings, and 6,000 tons of nonferrous metal castings, with special emphasis on machine castings, motor-vehicle castings, central heating boilers, heaters, and fittings. This production is to be achieved mainly by foundries of the machine-construction plants. A modern factory for heaters and central heating boilers will be built.

Through the activation of a number of new sections in the precision instrument and optical industry, the Six-Year Plan anticipates a sixfold increase in the value of production of this industry. Especially strong emphasis will be placed on increasing the production of antifriction bearings. Preparation for the production of antifriction bearings was started in 1950. In other divisions of the precision instrument and optical industry, production of hydrometers, gas meters, surgical tools, and optical apparatus will increase. The Six-Year Plan also specifies completion of construction of a ball-bearing factory and a typewriter factory.

The most inefficient section of industry was that which produces commodities on a mass scale. Screws, nails, wire, home furnishings, and similar commodities were produced almost exclusively by many small factories, whose production capacity surpassed the demand of the domestic market. The Six-Year Plan calls for production of screws, nuts, bolts, etc., to increase by 15 percent, building fixtures by 279 percent, and food cans and enamelware by 79 percent.

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The 3.5-fold increase in the production of the metalworking industry will be achieved by two means. First, about 40 large new plants will be constructed, and over 40 existing plants will be extensively expanded. The construction of new plants, mainly in nonindustrialized wojewodztwos, will somewhat distribute the metalworking industry. Besides the present Slask region, two other regions -- Warsaw and the region known as Zagłębie Staropolskiy (Old Poland Basin) -- will be highly industrialized. The second means of increasing metalworking production is to increase the production of the remaining plants (over 250) of the metalworking industry. Experience has proved that technical progress, better organization of labor, better utilization of reserves, and the conscientious efforts of the working class can achieve a faster tempo in industrial production in a number of branches of industry than can an increase in the number of machines and equipment.

The Six-Year Plan emphasizes the necessity of mechanizing internal transportation and auxiliary work in plants. Mechanized transportation of materials and parts to work sites, and the use of conveyers for mechanical transportation and of internal plant transportation facilities for mounting parts on machine tools, conserve the efforts of workers and increase production.

The mechanization of foundries is particularly important. This mechanization includes transportation within the foundry, especially transportation connected with the storage, preparation, and transportation of foundry sand. A sevenfold increase in machine molding during the Six-Year Plan is also of vital importance.

As pointed out by the law on the Six-Year Plan, the next stage of technological progress is automatization, i.e., the use of multiple-tool machine equipment, such as multiple-tool lathes, turret lathes, automatic lathes, multiple-spindle lathes, and unit-type machine tools.

The standardization of materials, parts, and units has great application. It permits a rapid construction of new types of machines and a conversion from low to high serial production.

Another requisite for the fulfillment of the Six-Year Plan is an increase in productivity. According to the plan, the metalworking industry should increase its productivity by 66 percent. Norms should be systematically improved, not only through technological progress but also through organizational progress. Better utilization of machinery will result in greater productivity.

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